

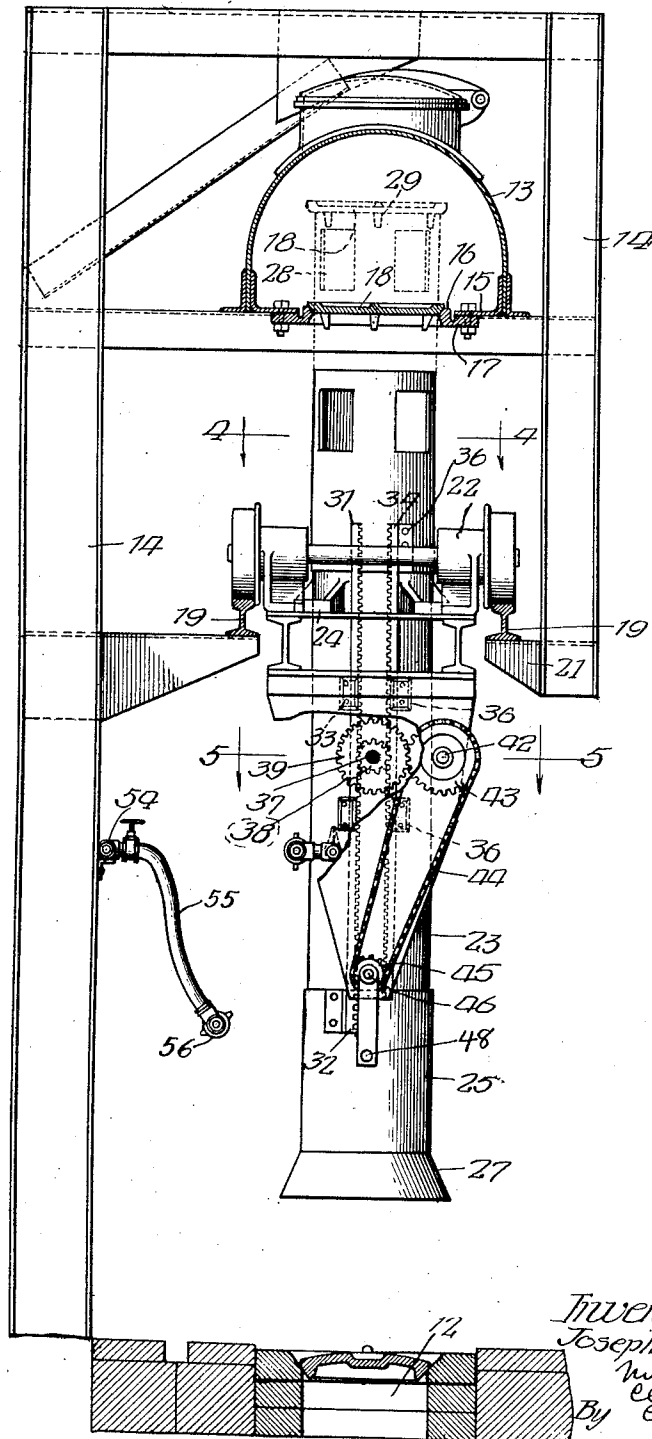
J. BECKER.
COKE OVEN SMOKE FLUE CARRIAGE.
APPLICATION FILED DEC. 2, 1918.

1,410,447.

Patented Mar. 21, 1922.

4 SHEETS—SHEET 1.

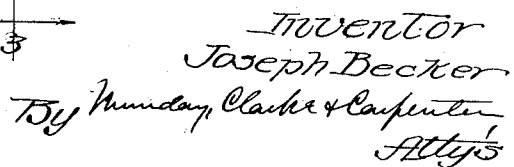
Fig 1



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4 SHEETS—SHEET 2.



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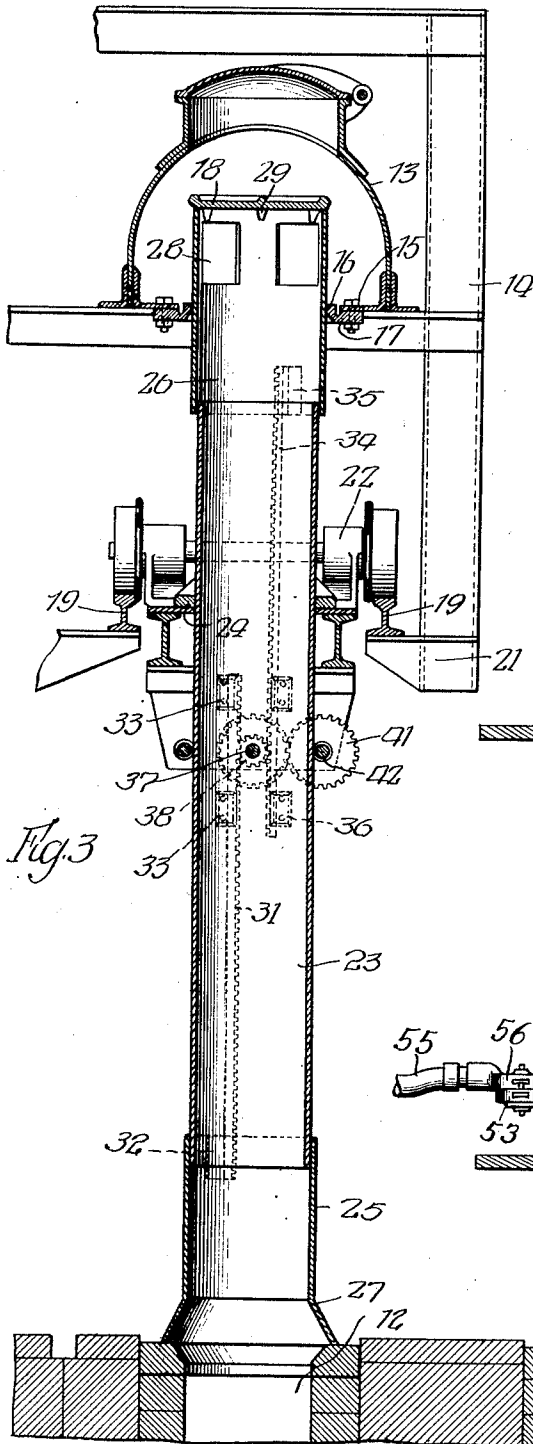


Fig. 4

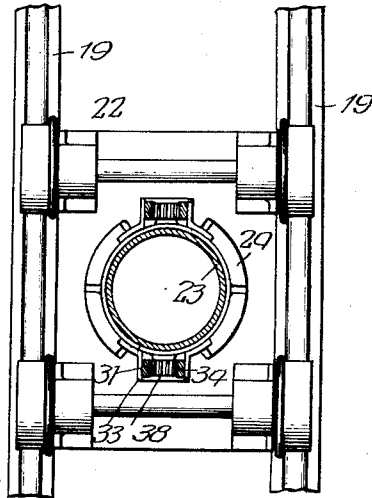
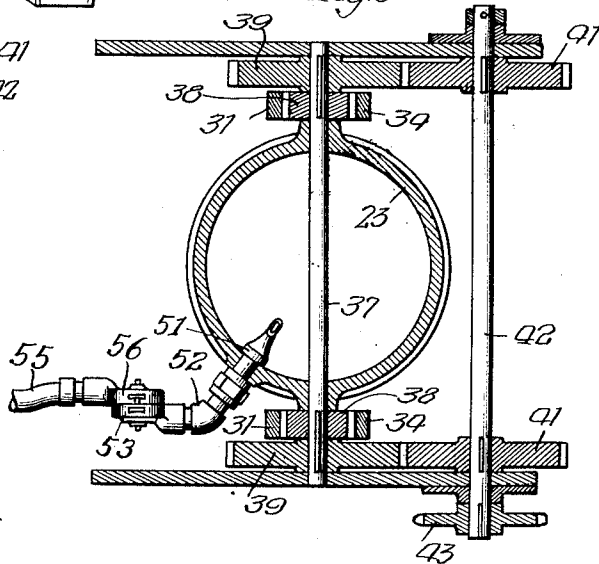


Fig. 5



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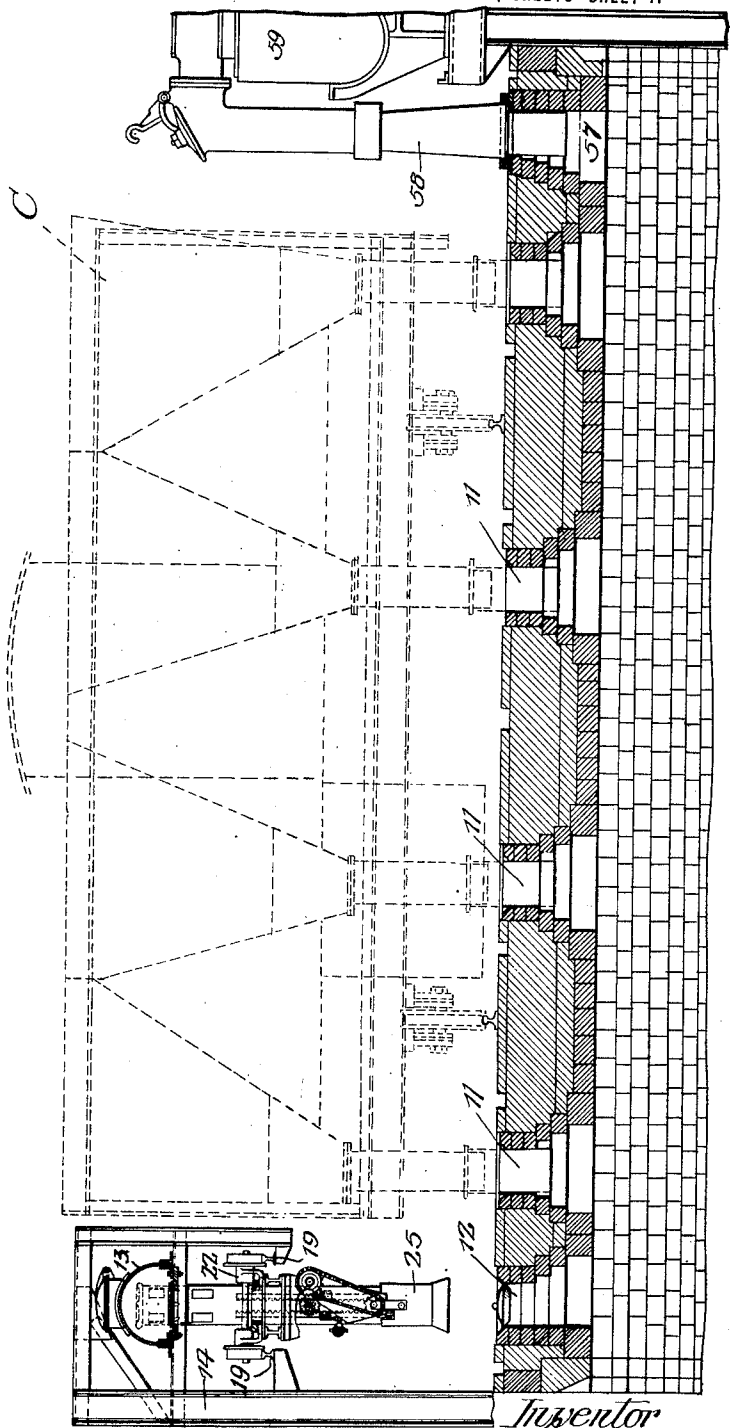
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4 SHEETS—SHEET 4.

Fig. 6



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UNITED STATES PATENT OFFICE.

JOSEPH BECKER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO THE KOPPERS COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

COKE-OVEN SMOKE-FLUE CARRIAGE.

1,410,447.

Specification of Letters Patent. Patented Mar. 21, 1922.

Application filed December 2, 1918. Serial No. 264,967.

To all whom it may concern:

Be it known that I, JOSEPH BECKER, assignor to The Koppers Company, a corporation of Pennsylvania, a citizen of the United States, residing in Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Coke-Oven Smoke-Flue Carriages, of which the following is a specification.

This invention relates in general to coking plants and has more particular reference to the provision of effective means for taking care of the smoke incidental to the charging or recharging of a heated coking oven.

In the coking of coal each charge as completely coked is pushed from the coking chamber and a succeeding charge is deposited therein immediately. There is of course a high temperature in the chamber and as the coal is poured in considerable smoke is evolved which is commonly discharged directly from the charging-holes and ascension pipes of the ovens into the open air.

This invention has for a principal object the provision of simple apparatus, in a coking plant, for carrying off this smoke, so that it may be led to the stack of the battery or any other stack or to a smoke consumer; usually it is led into the battery stack, where it is discharged at such height that the smoke nuisance to labor and vegetation is eliminated.

An object of the invention is the provision of means for taking care of the smoke incidental to charging and recharging without interfering in any particular with the recharging operations already in use in any particular plant, and without adding to the recharging apparatus proper.

Other objects and advantages of the invention will be apparent as it is better understood from the following description when considered in connection with the accompanying drawing illustrating a preferred embodiment thereof.

On the drawing,

Figure 1 is an end elevation of the apparatus provided to carry off smoke during recharging of the coke oven;

Fig. 2 is a partial side elevation of the apparatus shown in Fig. 1;

Fig. 3 is a vertical section through such apparatus;

Fig. 4 is a partial section taken substantially on the line 4-4 of Fig. 1; and

Fig. 5 is an enlarged section taken lower down and to more completely disclose certain details of construction.

Fig. 6 is a section taken crosswise through a coke oven battery equipped with the present improvements.

In the illustrated embodiment of the invention, there is shown in Fig. 6 a section through the top of a coking plant or battery, provided with a plurality of the usual crosswise extending coking chambers arranged in substantial parallelism one after the other. Each coking chamber is provided with a set of charging holes 11, a smoke outlet 12 independent of the charging holes and an independent gas outlet 57 which communicates with an ascension pipe 58 leading to the usual collecting main 59. During the coking operation the several charging holes 11 and the smoke outlet 12 are closed by suitable covers and the gases and products driven off during the coking of the coal within the chamber pass through the gas outlet 57 and the ascension pipe 58 to the collecting main 59 which carries them to any suitable by-product recovery apparatus. A lorry car C is illustrated by dotted lines in Fig. 6, said car travelling over tracks arranged longitudinally on the top of the coke oven battery and movable into position for recharging any one of the coking chambers through the hereinbefore mentioned charging holes 11. The lorry or charging car C may be of any preferred construction and need not be herein described in detail.

The several smoke outlets of the series of coking chambers are arranged in a line along one side of the oven and above these outlets is provided a smoke main 13 carried in a framework 14 supported from the top of the coke ovens. In the present instance the bottom 15 of this main is flat and is provided above each coking chamber outlet 12 with an opening 16 in which is placed a cover seat plate 17 normally closed by a cover 18 located within the smoke main and liftable from its bottom to open position.

Two tracks 19 are mounted upon brackets 21 of the frame 14 and extend along and over the smoke outlet openings 12 and a truck 22 is mounted upon these tracks. This truck carries a traveling connection for establishing communication between the individual several smoke outlet openings 12

and the smoke main. In the present instance this connection is an extensible one comprised of a central or main flue member 23 which is fixedly secured on the truck 5 by a collar 24 and provided with telescoping end or sleeve members 25 and 26. The lower end or sleeve member 25 is provided with an outstanding or flaring flange 27 adapted to close down over the the opening 10 12 to complete communication between the flue and the coking chamber, and the upper sleeve or part 26 is straight and is provided with side outlets 28 near its top,—both parts 25 and 26 telescope with the main part 23 15 and a common operating device to be presently described is provided to actuate them together in moving them from inoperative to operative position and vice versa.

In operation the truck is moved to bring 20 the main part in alignment with the appropriate opening 12 and the closure 18 of the smoke main above said opening 12. The closure is removed from the opening 12 and the operating device extends the smoke flue 25 until the flange 27 is in the position shown in Fig. 3 and the part 26 engages the cover and lifts it as shown on the drawing, the openings or outlets being disposed within the smoke main. Prongs 29 are provided 30 on the under face of the cover to guide the end 26 into accurate engagement. The manipulating or operating device comprises a pair of racks 31 fastened at 32 on the part 25 and having sliding bearings in brackets 35 33 on the main part 23, and a similar pair of racks 34 fixed at 35 to the part 26 and having sliding bearings in brackets 36. A shaft 37 mounted in the truck frame extends between the racks and carries two pinions 40 38, each pinion 38 being in mesh with the rack of each of the pairs 31 and 34. The shaft 37 also carries a pair of spur gears 39 which mesh with corresponding gears 41 on a shaft 42, also mounted in the frame 45 of the truck and carrying at its end a sprocket wheel or a gear 43 over which takes a sprocket chain 44 engaging a smaller sprocket wheel 45 on a stud shaft 46 having bearing in a downwardly extending wing 50 47 of the frame and in the main flue member 23. The stud shaft 46 carries a crank or operating handle 48, the gearing and parts just described being so arranged that the rotation of the operating crank or handle 48 causes the two ends or extensions to 55 be moved apart or together as conditions may require.

In order to further the removal of the smoke I provide means for injecting steam 60 upwardly in the path of the moving smoke and to this end nozzle 51 is positioned in the connection carried by the truck, in the present instance being located in the main part 23. This nozzle is carried on the end 65 of a pipe 52 having one part of a quick de-

tachable coupling 53 on the outside. A steam main 54 is carried by the frame 14 and this steam main is provided with a plurality of flexible branches 55 carrying the companion part 56 of said quick detachable coupling. The coupling is preferably of the character used in connection with air brake systems for railway trains and automatically opens as the coupling operation is effected. 75

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing its most material advantages, the form hereinbefore described being merely a preferred embodiment thereof. 85

I claim:

1. In a coking plant, the combination of a series of coking chambers, a smoke main, a connection for establishing communication between any of said chambers and said 90 main, said connection movable longitudinally of the main and having telescopic ends movable into communication respectively with said main and said chamber, and means for manipulating the telescopic ends 95 of said connection.

2. In a coking plant, the combination of a series of coking chambers, a smoke main a traveling connection between said chambers and said main, said connection having 100 ends movable into communication respectively with said main and said chambers, and a common means for manipulating said ends.

3. In a coking plant, the combination of 105 a series of coking chambers having charging inlets and independent smoke outlets, and a connection movable longitudinally with respect to the smoke main for establishing communication between the smoke 110 outlet and said main, said connection being normally disassociated from said main and having an end movable laterally into communication with said main to connect said smoke outlet and said smoke main. 115

4. In a coking plant, the combination of a series of coking chambers having smoke outlets, a smoke main, a truck movable adjacent said smoke main and the smoke outlets of several coking chambers, and a main 120 connecting pipe carried by said truck, the ends of said pipe being extensible into engagement with said main and appropriate outlets.

5. In a coking plant, the combination of 12 a series of coking chambers having smoke outlets, a smoke main, a truck movable adjacent said smoke main and the smoke outlets of several coking chambers, and a main connecting pipe carried by said truck, the 13

ends of said pipe being simultaneously extensible into engagement with said main and appropriate outlets.

6. In a coking plant, the combination of
5 a series of coking chambers having smoke outlets, a smoke main, a truck movable adjacent said smoke main and the smoke outlets of several coking chambers, and a main connecting pipe carried by said truck, the
10 ends of said pipe being simultaneously extensible into engagement with said main and appropriate outlets, and rack and pinion connections for controlling said ends.

7. In a coking plant, the combination of
15 a series of coking chambers having smoke outlets, a smoke main having smoke inlets

normally closed by internal closures, and a connector for establishing communication between said smoke outlets and said main and having an end adapted to move said 20 closures to open position, said connector being mounted on a truck having controlled travel in alinement with said smoke main and series of smoke outlets.

In witness whereof I have hereunto set 25 my hand in the presence of two subscribing witnesses.

JOSEPH BECKER.

Witnesses:

HENRY LOVE CLARKE,
JOS. VAN ACKERERY.